NORTHERN REGION

ENVIRONMENTAL MONITOR

Winter 1999/2000 U. S. Army Northern Regional Environmental Office

U.S. Army Showcases Combined Innovative Cleanup Technologies for Firing Ranges

By Bob Muhly
Army Region I/II REC

A relatively new program, entitled "RangeSafe," established by the Army to help commercialize emerging environmental technologies targeting the management, recovery, and remediation of residual contaminants generated throughout the life cycle of armament systems, is being marketed by Picatinny Arsenal, NJ, engineers. These Picatinny engineers are currently managing a demonstration project at Fort Dix, NJ, in concert with the New Jersey Department of Environmental Protection Innovative Technology program and the Fort Dix Environmental and Range Control offices. The Fort Dix project will demonstrate a novel method to clean lead-contaminated firing range soils through the application

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Range 24 "Phyto Bed" ready for planting winter wheat.

Fort Ritchie and Seneca Army Depot Among First to Receive PER Training

By Fred Boecher
Army Region III REC

ITR, IRP, EQR, EPR, ISR, ECAS……The military is rife with acronyms. Now there is another one to add to the lexicon of military acronyms associated with the environmental program: PER, which stands for Principles of Environmental Restoration. PER is a workshop that is an outgrowth of independent technical reviews (ITRs), formerly peer reviews, that were conducted on installation restoration projects. Two installations in the Northern Regional Environmental Office's area, Fort Ritchie (MD) and Seneca Army Depot (NY), were among the first installations to receive the PER workshop.

What exactly is a PER workshop, how did it evolve, and what is it trying to accomplish, are a few of the questions we will try to answer.

In 1997, the Army launched a pilot program of peer reviews of Base Realignment and Closure (BRAC) installation restoration projects. The peer reviews were conducted using a team of technical subject matter experts, and addressed specific remediation sites at an installation. The reviews focused primarily on the technical efficacy of the restoration program. In 1998 the program was expanded to include active installations, and the name was changed from peer review to ITR. Since the initiation of the pilot peer reviews in 1997,

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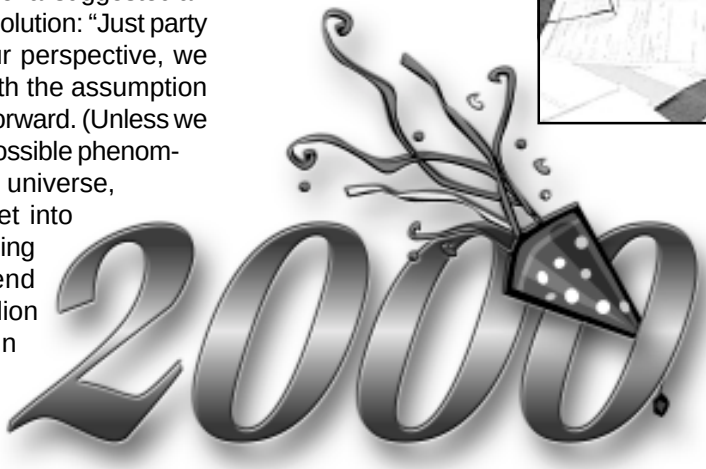
In This Issue

From the Chief

By Bill Herb,
Chief, NREO

Well, the new millennium has finally arrived…or has it? The mathematical purists insist that it really won't start until 1 January 2001 when the 2000th year will have expired, but those of us who are more pragmatic point to the year shown on our calendars for January, and conclude that something indeed has changed. A recent editorial suggested an elegant compromise solution: "Just party twice." Whatever your perspective, we probably do agree with the assumption that time only moves forward. (Unless we want to consider the possible phenomenon of a contracting universe, but I don't want to get into that here…...my planning horizon doesn't extend out seven or eight billion years and Stephen Hawking wasn't available for comment.) Nevertheless, the clock has moved on, and even if we are not observing massive, millennial changes, we need to move on, too.

Time passes, but old issues persist: the Army remains concerned with open and new enforcement actions (ENFs). The Army continues to receive a disproportionate share of ENFs and fines. It doesn't seem to matter how the data are "normalized" — ENFs per inspection, fines per inspection, ENFs per installation, ENFs per soldier (airman, marine, sailor) — the Army always suffers by comparison with the other services. The ACSIM has taken steps to address this issue, and is planning further actions.



Policy and Guidance initiatives have facilitated prevention and closure of ENFs and ensured that the Army counts ENFs the same way as the other services; the Army Must Fund Policy has been reissued.

Command emphasis and awareness of environmental compliance is being increased by:

- providing new installation commanders with a copy of their installation's environmental profile
- conducting discussions between ACSIM and MACOM Chiefs of Staff
- disseminating information on key environmental issues through ACSIM Garrison Commander's Notes
- briefing ENFs and fines at the August Garrison Commander's Conference
- providing quarterly updates on MACOM ENF/fines status to the Army Secretariat and Chief of Staff, and

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Our Mission: *The NREO was established in 1995 to support the Army and DoD mission through coordination, communication and facilitation of regional environmental activities. The Army REOs are part of a DoD network in which the Army, Navy and Air Force each has lead responsibility for mission implementation in the federal regions. The NREO has DoD lead responsibility for Region V, and Army lead responsibility for Regions I, II, III and V.*

U.S. EPA Region III Office Gets New Regional Administrator

[Drawn from U.S. EPA Press Reports]

Bradley M. Campbell

In mid-December, 1999, Bradley M. Campbell succeeded W. Michael McCabe as the Regional Administrator for the U.S. Environmental Protection Agency (EPA) Region III office in Philadelphia. Mr. McCabe was promoted to the position of EPA Deputy Administrator, the agency's No. 2 job, in Washington, D.C.

Mr. Campbell moved to EPA Region III from the White House Council on Environmental Quality (CEQ), where he served most recently as Associate Director for Toxics and Environmental Protection. Prior to his CEQ service, he was an attorney-advisor in the Environment and Natural Resources Division of the U. S. Department of Justice.

A native of Philadelphia, Mr. Campbell is a magna cum laude graduate of Amherst College (B.A., 1983) and a cum laude graduate of the University of Chicago Law School (J.D., 1987). Following graduation from law school, Mr. Campbell had an active criminal and civil litigation practice that included extensive representation of environmental organizations concerned with the Chesapeake Bay watershed.

At CEQ, Mr. Campbell helped coordinate administration policy and legislation on Superfund, hazardous waste, safe drinking water, pesticide and food safety, brownfields, wetlands, and community right-to-know. Mr. Campbell also oversaw issues involving agriculture, federal facilities and environmental justice. His activities included helping develop the administration's brownfields initiative, leading reforms of hazardous waste laws and of environmental liability for lenders, serving as the administration's lead representative to the 104th Congress in amending the Safe Drinking Water Act, negotiating an administration plan to resolve a long-standing dispute over economic and environmental issues surrounding dredging in the Port of New York and New Jersey, and developing legislation for the 105th Congress to authorize alternative environmental compliance.

During his service at the U.S. Department of Justice, Mr. Campbell served as lead counsel in several prominent cases, including defense of the lender liability rule under CERCLA (Kelley v. EPA), trial of the leading CERCLA enforcement case involving lender liability (United States v. Fleet Factors), and the successful defense of challenges under the National Environmental Policy Act (NEPA) to the North American Free Trade Agreement and the Uruguay Round Agreement under the auspices of the General Agreement on Tariffs and Trade.

In 1993, Mr. Campbell received the 1993 Arthur Fleming Award for distinguished government service, which is based on a national competition. In that year he also received the John Marshall Award, the Justice Department's highest honor.

Mr. Campbell is co-founder of the Common Ground Community Housing Development Company in New York City, and he chairs the board of the Echo Hill Outdoor School in Worton, Maryland.

(Continued from page 2)

- submitting a Chief of Staff of the Army Weekly Summary article on ENFs and fines.

Other similarly-directed initiatives include:

- providing DoD semi-annual reports to MACOM Chiefs of Staff
- providing review of compliance program status at MACOM Engineer Conferences
- developing command information papers and updates for General officer and Garrison Commanders Leadership Conferences
- focusing increased attention on ENF closure during MACOM Environmental Quality IPRs
- ACSIM requiring MACOMs to provide briefings on corrective actions proposed to deal with significant ENFs, and
- requesting DAIG to include environment as a special item of interest on several IG inspections in CONUS beginning in FY00.

The ECAS program has been strengthened by further developing root cause identification methodology, evaluating effectiveness of ISO 14000 at pilot installations, and increasing ECAS funding.

ACSIM considers FORSCOM's Environmental Campaign Plan 2000-2020 a good example of how MACOMs can take a proactive approach to environmental management.

As future plans are developed and refined, stay tuned to the NREO Monitor for further information. The long-standing offer from the Northern Regional Environmental Office (NREO) to Army installations is still open: if your MACOM concurs, we will assist in obtaining response/approval for ENF closeout requests/notifications.

— HAPPY NEW MILLENNIUM!

Thinking Outside THE BOX ON

By Colonel Walter J. Cunningham (Ret.)
Formerly U.S. Army Engineering and Support Center, Huntsville

[Reprinted from the U.S. Army Environmental Center Environmental Update*, Fall, 1999]*

As penitence for going to graduate school, I was sent to a research laboratory, where I was given the responsibility of creating a research program. If there ever was a time to think outside the box, that was it. One of the things I noticed was the tendency to try to fit new requirements into an existing program and then base our solutions on what we knew how to do — in effect, taking the new problem and stuffing it in the old box.

If, for example, we knew something about concrete, then all our new requirements miraculously had concrete solutions. This was particularly glaring when we tried to come up with mobile overhead cover for airborne units. As I recall, the air-dropable concrete pillbox did not get many adherents at Fort Bragg.

The clearance of unexploded ordnance (UXO) reminds me of my experience at the lab. For a variety of reasons, various groups try to stuff UXO clearance into one of two existing boxes: the military operations box or the hazardous waste box. While UXO clearance has aspects of both, it is a unique situation. If we are to efficiently reduce the risk to the public and protect the workforce, we will need solutions tailored to the problem.

Military operations treat UXO clearance as a countermine operation. Much of the research and technology applied to UXO clearance is a modification of previous countermine programs. However, the two problems are very different. Mines are shallow and intentionally deadly. We want sensitive equipment to pick up every possible trace of the weapon. We want to mark the extent, usually so we can move around it. In some cases, we attempt to find everything and mark the locations so we can breach or clear it. There is a premium on finding the mines at a standoff. Speed is critical. The management structures in which the technologies are embedded are largely tactical elements. Costs are ultimately measured in tactical efficiency and casualties.

UXO clearance is different. Unexploded ordnance depths vary widely, and the heaviest and most dangerous UXO can be very deep. UXO was intended to explode, so its deadliness varies widely. We want technologies that discriminate. We need to mark the extent of the UXO hazard, but UXO contamination tends to be larger, less predictable and more random than mines. Finding everything that can harm the public is critical.

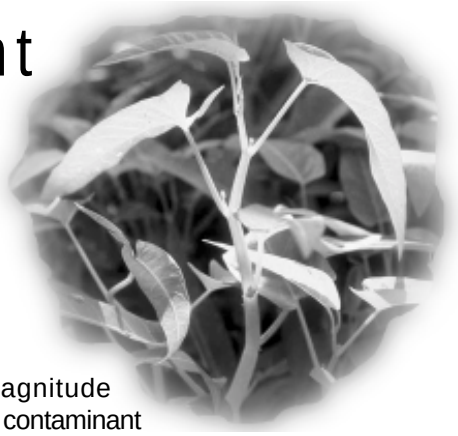
We have the ability to tailor our technical and management processes. Technologies and processes developed and optimized for countermine operations are almost certainly not going to be optimal for UXO clearance, if not downright ineffective. In the hazardous waste box, UXO appears to be treated like any air or water quality problem. Both industry and government have organizations and processes to manage, regulate and clean up other hazardous waste. Those organizations need to recognize the differences between UXO clearance and hazardous waste cleanup. There is common ground that, if exploited effectively, will ease the UXO burden. From the industry perspective, we need to create organizations that can effectively integrate the tasks necessary to clear an ordnance-contaminated site efficiently.

From the government perspective, we need experts at every level. If, for example, "mag and flag" is approached like a variant of pump-and-treat, then we will rework a site for decades at exorbitant costs with little reduction in the actual risk to the public. In addition, there must be recognition of the risks to the workers as they clear a site. Dramatically increasing the chance of a life-threatening accident to eliminate minor contamination that may have little practical impact on the environment or public health and safety is unconscionable.

It is hard to expand our horizons and think outside our normal experience. Most situations do not manifestly require us to stretch our imaginations. This very human tendency is magnified if the task at hand is dangerous. As the risks go up, risk taking goes down. Most people do not think outside the box because they are the box. At this point in the evolution of the ordnance clearance program, we need to reverse those tendencies.

[Ed. Note: When this article was written and published in the USAEC Environmental Update, COL Cunningham was serving as commander of the U.S. Army Engineering and Support Center, Huntsville, Ala. COL Cunningham has since retired, and is now in private consulting practice.]

Ravenna Army Ammunition Plant Develops Ecological Baseline



By Hugh McAlear
Army Region V REC

Ravenna Army Ammunition Plant (RVAAP), OH, has several areas within its 21,419-acre facility that are being evaluated for past contamination under the Defense Environmental Restoration Program. At the same time, RVAAP is collecting data that will be useful in determining the impact of future activities at the plant.

RVAAP recently transferred approximately 17,000 acres to the National Guard Bureau, which in turn will lease the land to the Ohio National Guard for a training area. Because much of the land has lain fallow at the inactive ammunition facility, environmental managers of both RVAAP and the Ohio National Guard foresaw a unique opportunity to document the ecological condition of the installation prior to the start of Guard training activities.

Taking inventory of the plants and animals at RVAAP is a critical step in protecting what exists. A group of scientists is observing the area's fields and forests, and counting the types and numbers of plants and animals. This data will form a baseline for future evaluations of training site use. Scheduled to be completed in 2000, the inventories also will supply environmental managers with the names of the most prevalent and rare plants and animals. By knowing which natural resources need protection and special consideration, trainers and their troops can develop environmental management guidelines.

The inventories further will serve as an adjunct to the ecological receptors studies being conducted as part of ongoing remedial investigations into the extent and magnitude of contaminant concentrations on RVAAP. Populations of plants and animals in areas where contamination is a concern will be compared to similar species populations in unaffected areas. This information will be useful in conducting ecological risk assessments and possibly in defining remedial cleanup goals for specific contaminants.

More information on the Ravenna environmental activities can be obtained from Mark Patterson, RVAAP, at (330) 358-7311.

Badger Army Ammunition Plant Initiates Bio-Remediation Pilot Project to Treat Dinitrotoluene Soil Contamination

By Hugh McAlear
Army Region V REC

In a press release dated December 9, 1999, Dave Fordham, Badger Army Ammunition Plant Installation Director, announced the start of a project to install an innovative bio-remediation system to treat dinitrotoluene-contaminated soils at the plant. "Badger will be the first site in the country where this technology has been used to remove dinitrotoluene on this scale," Fordham noted. "However, we're confident the system will work effectively here because it's been extensively tested in laboratories using soil from Badger."

The demonstration is part of a larger technology program being undertaken by the U.S. Air Force Center for Environmental Excellence (AFCEE). In the spirit of multi-service cooperation, the U.S. Army Environmental Center asked AFCEE to include an Army installation in its multiple-site demonstration of in-situ bioremediation. After screening numerous sites, Badger was selected.

Because this is an innovative technology, a pilot application initially will be evaluated in the central part of Waste Pit One at Badger's Propellant Burning Ground. Bio-remediation itself is not new with regard to dinitrotoluene; studies have shown that micro-organisms, including soil bacteria occurring naturally, will consume the contaminant. But bio-remediation is a slow process. The innovative application at Badger hopes to speed up the process.

First, oxygen will be injected into the soil to aid bacteria in their ability to consume the dinitrotoluene. Second, the system will pump groundwater from 100 feet below grade to the surface. There, acidity will be neutralized and nutrients such as molasses will be added to the water, which then will percolate back through the ground, leaving nutrients for the bacteria. "This will be a continuous loop process, treating both soil and the groundwater," Fordham commented.

Installation is expected to take two to three months to complete. Once finished, the Wisconsin Department of Natural Resources and Region V of the Environmental Protection Agency will oversee the Army's operation of the system. Three months of data will be evaluated to see how well the process meets its objectives. If all goes as planned, the bio-remediation system will be extended over the remainder of Waste Pit One as well as to Waste Pits Two and Three.

More information on the Badger innovative treatment process can be obtained from Dave Fordham at (608) 643-3361 or (608) 356-5525.

AROUND THE STATES AND EPA REGIONS

[From Staff Reports]

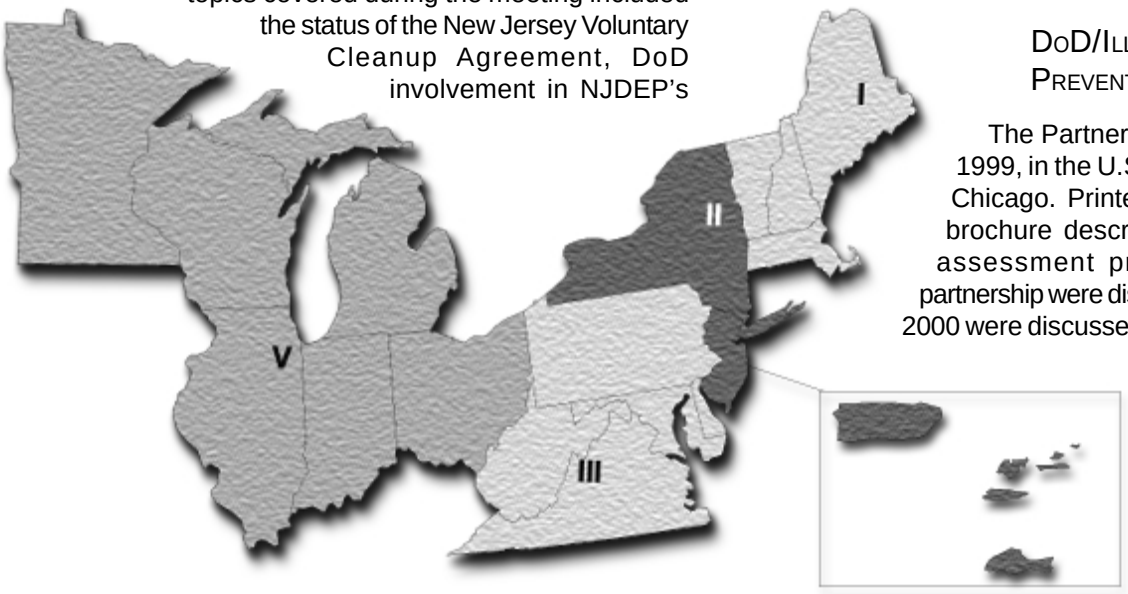
New Jersey Voluntary Cleanup Agreement

The Army Region I/II REC and NREO Regional Counsel met on November 16, 1999, with other-Service representatives and Ms. Karla Perri, Assistant Deputy Under Secretary of Defense (Environmental Cleanup), to review progress toward a Voluntary Cleanup Agreement (VCA) with New Jersey and plan for the next round of discussions with the state. Ms. Eleanor Winsor, the consultant hired by DoD to facilitate the New Jersey VCA, reported that the main issue voiced by DoD and New Jersey officials during her interviews concerns the differing DoD/state interpretation of the 10-6 Risk-Based cleanup value. It is clear that the New Jersey VCA will not follow the same track as the Pennsylvania Multi-Site Cooperative Agreement, but instead will be more like a "partnering" agreement.

A DENIX Web site is being constructed to allow open lines of communication among VCA participants. Copies of current New Jersey VCAs with private industry will be distributed, or posted to the new Web site, for participant review and comparison. The current schedule calls for the VCA to be ready for signature by April 2000.

New Jersey/EPA/DoD Quarterly Environmental Work Group and P2 Partnership Group

The two groups met on October 21, 1999, at New Jersey Department of Environmental Protection (NJDEP) headquarters in Trenton. Installation issues were the first topic of discussion in the Environmental Work Group session. Picatinny Arsenal representatives reported that the additional sampling parameters required to address Perchlorate issues have significantly increased Subpart X permit-related costs. This apparently is a state-wide issue, affecting other DoD facilities as well. Other topics covered during the meeting included the status of the New Jersey Voluntary Cleanup Agreement, DoD involvement in NJDEP's Environmental Technology Expo 2000, RCRA Cleanup reforms, and the U.S. EPA's push for Environmental Management Reviews at military installations.



The P2 Partnership Group opened its session with discussion of Service P2 initiatives in the state. The remainder of the meeting was devoted to Executive Order 13101/RCRA section 6002 and the federal requirement to buy recycled products. Beginning in CY 2000, the U.S. EPA will inspect facilities with an eye on "recycled product procurement."

New York/DoD Quarterly Work Group

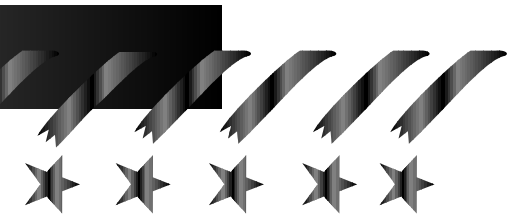
The New York/DoD Quarterly Work Group met on September 22, 1999, in the Albany headquarters offices of the New York State Department of Environmental Conservation (NYSDEC). Principal topics included a recap of the New York P2 Conference held in August in Rochester, the munitions rule training conducted the previous week in September at Fort Drum, BRAC facilities in New York (i.e., cleanup and productive new use), the enhanced Vehicle I/M Program, and RCRA 6002 (i.e., concern with vehicle maintenance - whether motor pools will be in violation).

Region III EPA/DoD/State Environmental Colloquium

The next Region III Environmental Colloquium involving DoD, U.S. EPA and state regulators is scheduled for August 22-24, 2000, at the Omni Hotel in Baltimore. The theme will involve some combination of compliance assistance and partnering. Social functions being considered include a luncheon, a private reception at the aquarium, and a dinner cruise in the Baltimore Inner Harbor.

DoD/Illinois Pollution Prevention Partnership

The Partnership met on November 3, 1999, in the U.S. EPA Region V offices in Chicago. Printed copies of the new P2 brochure describing the P2 opportunity assessment program offered by the partnership were distributed. Goals for the year 2000 were discussed, and efforts will be made to develop and establish a training curriculum under the auspices of a training subcommittee. Partners will complete an annual achievement report to document past activities and establish



objectives/targets for the coming year. U.S. EPA Region V provided a briefing on the Waste Wise program, which focuses on municipal solid waste. Rock Island Arsenal briefed the Partnership on the establishment of a P2 partnership with the City of Rock Island.

DoD/Indiana Pollution Prevention Partnership Meeting

The Partnership met on December 10, 1999, at the Indiana Department of Environmental Management in Indianapolis. A Partnership Listserve (dod-inp2@great-lakes.net) has been established, and a web page is under development. Representatives of the Indiana Department of Environmental Management and the Air Guard Base at Terre Haute were selected to serve as co-chairs for the partnership during the coming year. A speaker from the Indiana Clean Manufacturing Technology Institute briefed the Partnership on solvent substitution options for parts cleaning.

Future agenda topics include development of a strategic plan, and Partnership participation in P2 conferences to be held in Indiana in the late summer/early fall 2000.

DoD/Michigan Pollution Prevention Alliance Meeting

The Michigan Air Guard Combat Readiness Training Center hosted the meeting in Alpena on October 26, 1999. The Alliance Listserve (dodmip2@great-lakes.net) has been installed on the server managed by the Great Lakes Regional Pollution Prevention Roundtable. An Alliance web site, still under development, will be managed by the Michigan Department of Environmental Quality. The October meeting focused on hazardous waste management and parts washers, and ended with a tour of the hazardous waste pharmacy and vehicle maintenance shops at the Alpena Air Guard unit.

DoD/Ohio Pollution Prevention Partnership Meeting

The Partnership met on November 30, 1999, in Columbus, in the offices of the Ohio EPA. The Opportunity Assessment Subcommittee has prepared an introductory questionnaire and briefing for use in conducting opportunity assessments at DoD entities. A draft tri-fold Opportunity Assessment brochure was distributed for comment, as was a draft strategic plan for the Partnership. Both are expected to be ready for adoption at the next meeting. The 179th Airlift Wing (Air National Guard) reported success in achieving a greater than 50 percent reduction of hazardous wastes generated in connection with treatment of C-130 engine compressor wash water and aqueous-based parts washer water.

Wisconsin/DoD Pollution Prevention Alliance Meeting

The Wisconsin Army National Guard hosted the Alliance on November 9, 1999, in Madison. Web site options were discussed to link into the DENIX site for the DoD/State P2 partnerships. The Alliance Charter is almost complete, and will be printed for distribution at the next meeting. An Alliance award program has been established to recognize military and civilian innovations and P2 successes. The next meeting will focus on waste paint disposal options and Defense Reutilization and Marketing Office activities.

For further information on these activities, contact:

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"RangeSafe"

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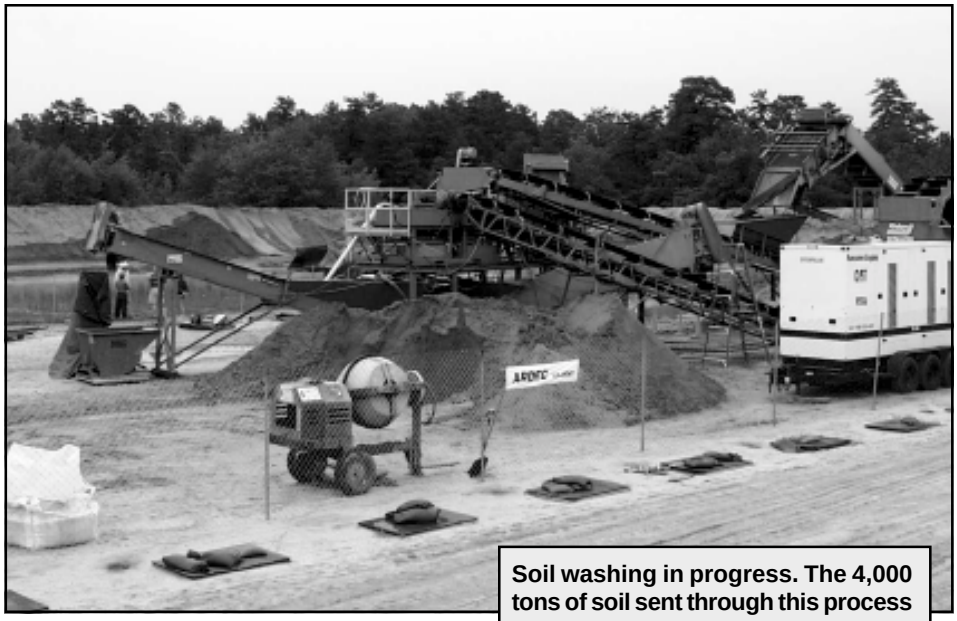
of a soil washing technology coupled with an agriculturally based biotechnology known as phytoremediation.

It's a fact that lead can be harmful to human health, whether it pierces the skin in the form of a projectile or is ingested orally. For years the military has used lead-based ammunition, testing and training with various weapon systems, firing down range at any number of military installations nationwide. Fort Dix, for example, has conducted various forms of munitions training, shooting down range at the 85 ranges located on its 50 square miles of property, since opening in 1917. Use of these ranges over the years has caused lead contamination to range soils.

The problems surrounding soil contamination from lead, and its associated effects on the military's mission and the activities of local civilian communities, are evident at a number of military installations. For example, soil and groundwater contamination at the Massachusetts Military Reservation in Cape Cod has received a great deal of public scrutiny in recent years, preventing military training and range use. In another case, public concern regarding potential lead contamination from the ranges at Fort Dix, NJ, has occurred within recent months. Military training and testing at these and other sites have been halted or curtailed because of lead contamination of soils and apparent migration to underground or surface waters.

Supersack with some of the 14 tons of lead slugs removed during soil washing.



Soil washing in progress. The 4,000 tons of soil sent through this process yielded approximately 14 tons of spent slugs.

To combat the continuation of lead contamination at military ranges, the Army implemented the "Green Bullet" program, in which a non-toxic metal (tungsten) is being substituted for lead in small arms ammunition. Full-scale production of "green bullets" has gotten underway, and many military facilities, such as the Massachusetts Military Reservation, already have received shipments. However, without clean ranges, the full benefits of "green bullets" cannot be realized.

Developed as a companion to the "Green Bullet" program, RangeSafe is seeking to demonstrate a lower cost and more environmentally friendly approach to range cleanup. The RangeSafe program takes a new and novel approach to soil cleaning, by combining two different technologies which, when brought together, are capable of removing both the particulate (chunks) and the ionic (fine dust) forms of lead and other heavy metal contaminants. It is the micro fine dust, formed over many years as the bullet chunks corrode in the soil, which migrates and contaminates groundwater.

The new system treats contaminated soils by first removing the larger particulate metal in a particle separation step, which can be viewed almost as a modern-day equivalent to panning for gold. It relies on differences in material density to separate the lead from the soil. Essentially, the soil will float in a column of water while the lead sinks to the bottom and is captured.

The second step targets the removal of the remaining lead dust from the soil through a unique method by which certain plants actually extract the lead from the soil through their roots. Phytoextraction, as it is called, is an emerging technology that uses specifically selected metal-accumulating plants that literally absorb the micro fine dust from the soil and concentrate the metal in the above-ground plant tissue. The plants are harvested with minimal disruption to the soil ecosystem, and the lead is extracted from the dried plant material for recycling by a battery manufacturer. The cleaned soil is then returned to the firing range.

Picatinny engineers chose Fort Dix's Range 24 for its first full-scale employment and demonstration of the new system. The Department of Defense provided $1.7 million to fund the project. The first step, soil washing, took place in September 1999, during which 4,000 tons of soil were excavated for sifting out the larger lead particles. Workers removed approximately 14 tons of lead slugs, reducing reported lead levels from 6,800 parts per million to 385 parts per million

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Updated Department of Defense Pollution Prevention Strategy Being Formulated

By Hugh McAlear
Army Region V REC

At the 4th Annual Joint Services Pollution Prevention Conference and Exhibition held in San Antonio from December 6-9, 1999, keynote speaker Mr. Bruce de Grazia, Assistant Deputy Under Secretary of Defense for Environmental Quality, described the updated Department of Defense (DoD) pollution prevention strategy being formulated to succeed the current strategy, whose goals expired at the end of 1999.

The current strategy stresses pollution prevention as the way to meet compliance requirements. Mr. de Grazia noted that while the strategy has been successful in lowering costs, it has been largely an environmental security program effort. The draft updated strategy aims to go beyond the traditional environmental programs to promote pollution prevention. According to Mr. de Grazia, the greatest potential for pollution prevention investment lies in such other programs as acquisition, maintenance, operations and purchasing. The updated strategy therefore seeks to stress pollution prevention in relation to "return on investment."

MR. DE GRAZIA OUTLINED SIX GOALS BEING CONSIDERED IN THE DRAFT STRATEGY:

1. INCORPORATE LIFE-CYCLE COSTS INTO ACQUISITION SYSTEMS
2. ENSURE THAT FUNDING POLICIES SUPPORT POLLUTION PREVENTION
3. INSTILL A POLLUTION PREVENTION ETHIC THROUGH EDUCATION, TRAINING AND AWARENESS
4. PROMOTE POLLUTION PREVENTION THROUGH OUTREACH AND PARTNERSHIPS
5. DEVELOP POLLUTION PREVENTION BUSINESS PRACTICES
6. COORDINATE DOD POSITION/POLICY WITH RESPECT TO THE U.S. GLOBAL CLIMATE CHANGE REGULATIONS

Objectives for the new goals are expected to be driven largely by requirements outlined in Executive Orders that have been released in the past year and one Executive Order yet to be released. These orders address such areas as affirmative procurement, waste prevention, energy efficiency, climate change, bio-based products, toxic chemical releases and criteria pollutants.

PER TRAINING

(Continued from page 1)

projects at over 40 active and BRAC installations have been conducted.

One of the initiatives that has resulted from the ITR is the development of the PER workshop. Four key principles of environmental restoration form the cornerstone of the PER workshop: (1) build an effective project management team; (2) clearly, concisely, and accurately identify the problem; (3) identify possible response actions early; and (4) recognize that uncertainties are inherent and always will need to be managed. The workshop addresses the applicability of these principles across the spectrum of restoration efforts - from site investigation planning through site closeout - and how they can be used to improve the decision-making process at most sites.

The purpose of the PER workshop is to provide tools and approaches that will help decision-makers collect appropriate investigative information and proceed more quickly to acceptable site close-out. The workshop is based on a course prepared jointly between DOE and EPA, and stresses the need for early planning and development of data quality objectives and early development of exit criteria to ensure that investigations and cleanups stay on track.

The course is intended to (1) provide sufficient understanding of ER principles to ensure that proposed investigative and cleanup requirements are needed to support risk-based decisions and actions; and (2) improve the process within which the installation project teams operate to better focus on the end objectives of the restoration program.

The PER workshop allows for the review and open discussion of specific projects or sites at an installation by incorporating those reviews into the exercises that are used at the conclusion of various modules of the workshop. By including these site reviews as an integral part of the workshop, no report is prepared by the instructors, as is done by the review team at the conclusion of an ITR. However, ITRs are still being performed at installations, especially in cases where there are complex and difficult technical issues to address at specific restoration sites.

Principles of Environmental Restoration training and Independent Technical Reviews are conducted at the request of an installation, or some other organization in their chain of command, such as their MACOM or the ACSIM. The Army Environmental Center manages the PER and ITR programs to include the scheduling of the installations and the organization of an appropriate review team.

If you think one of these programs could be of assistance to your installation restoration program, contact your MACOM restoration program POC.

Army Researches Means to Reduce Pesticide Use

By Mitch Bryman
NREO Environmental Specialist

In August 1999, the U.S. Environmental Protection Agency (EPA) presented a Special Achievement Award to the Department of Defense (DoD), recognizing the Department's efforts to reduce pesticide use on military installations by 50 percent, two years ahead of schedule. The Army significantly contributed to this achievement by reducing pesticide releases 36 percent - the equivalent of more than 130,000 pounds of pesticide active ingredient (PAI), or more than 65 tons of non-point-source environmental pollutants.

To help reduce human and environmental exposure to pesticides, the Department of Defense signed an agreement with the EPA, joining forces with the agency in its Pesticide Environmental Stewardship Program (PESP). The PESP is a voluntary partnership program to reduce pesticide use nationwide. Through PESP, the Defense Department set forth a goal to reduce the amount of PAI used at DoD installations 50 percent by the end of fiscal 2000, based on the amount used during fiscal 1993.

Army installations have been able to dramatically reduce their use of PAI by:

- renewing their commitment to Integrated Pest Management (IPM);
- improving the quality of pesticide use data gathered from Army installations; and
- funding research to identify and scrutinize alternative IPM strategies.

Integrated Pest Management

Dr. Steven Bennett is the U.S. Army Environmental Center (USAEC) team leader for pest management and the Center's media manager for compliance with the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). Dr. Bennett also serves as a senior consultant to the Army for pest management and is the current chairman of the DoD Armed Forces Pest Management Board. According to Dr. Bennett, "the primary goal of the military's pest management program is to lessen damage to health, property and natural resources caused by pests." Dr. Bennett added that IPM has been promoted by the DoD as a tool for the services to meet its pesticide reduction goals and address the risks posed by insects, rodents, birds, weeds, fungus and microorganisms that jeopardize troop readiness.

He said the IPM program "integrates" monitoring the pest population, knowledge of the targeted pest's behavior, recording and analyzing the amount and frequency of pest control methods, and communicating results to prevent pests and pest-borne diseases from causing unacceptable damage. "IPM may employ a wide array of molds, fungi, wasps, beetles and other natural predators and parasites that feed on the targeted pest," Dr. Bennett said. "Still other methods may infect pests with viruses and bacteria that kill the pest but leave beneficial plants, animals and insects untouched. Additional IPM strategies also may use pheromones to disrupt insect reproduction."

With more than a million different species and a global population estimated to be in the trillions, insects may be the most successful creatures on our planet. Complicating matters further, a growing number of new pests - in many cases weeds - continue to enter and spread across all regions of the United States. Their impact on military readiness, training operations, agriculture, native ecosystems and human health cannot be ignored.

The challenges posed by harmful non-indigenous, invasive plants and animals

"IPM may employ a wide array of molds, fungi, wasps, beetles and other natural predators and parasites that feed on the targeted pest."

Dr. Steven Bennett
Integrated Pest Management Team Leader, USAEC

are expected to only increase over time. The magnitude of the problems posed by invasive species is underscored by President Clinton's Executive Order 13112, "Invasive Species," signed February 3, 1999. The order establishes federal agency responsibilities for identifying and managing invasive species.

Tobyhanna Army Depot in Pennsylvania, the largest communications and electronics maintenance facility in DoD, achieved a 56-percent reduction in pesticide use in part by encouraging the nesting of insect-eating cliff and barn swallows, and by maintaining more than 100 nests and suitable habitats for the swallows. The depot also achieved this reduction by switching to mowing weeds instead of spraying them with herbicides and by baiting specific pests rather than spraying insecticides. Despite downward trends, records also show, in any given year, about 20 percent of Army installations use more pesticides than the previous year - reflecting always evolving pest-related challenges.

Record Keeping

Defense Department policy more than meets the requirements of the EPA and most state regulations by requiring detailed records of all pesticide operations on military installations, and by ensuring that all personnel who apply commercial-grade pesticides are certified. Military records keep track of all pesticide applications such as work done on golf courses and pesticide application by non-appropriated fund activities, by contract services, within land management and forestry programs, for programs involving installations lands leased for commercial purposes, and for work performed by installation pest control shops.

Maintaining accurate historical records has allowed DoD to estimate that 60 to 70 percent of all reported pesticide applications at military installations have been used to control weeds and fungus. This figure reflects national use, as herbicides comprise some 67 percent of pesticide production in the United States, according to a 1990 EPA report. While golf courses are usually thought of as being heavy users of herbicides, golf course herbicide activities vary widely and, on average, account for only 20 percent of the herbicides applied at Army installations.

Research

The employment of biological weed control methods as a viable alternative to the application of herbicides has been poorly promoted in the United States, Dr. Bennett said. Basic research involving the ecological interactions of undesirable plants and biological agents used to control them is lacking. Consequently, the ability to select appropriate biological weed control agents can be a formidable challenge. Recognizing this scarcity of information, the USAEC, the U.S. Army Center for Health Promotion and Preventive Medicine, and the U.S. Army Corps of Engineers, Waterways Experiment Station,


Barn Swallows

have undertaken research to identify alternative technologies that would help Army installations better address the pest problems that are unique to military operations. The intent is to meet or exceed the goals set forth in the PESP.

The need for alternative pest control methods is exemplified by pests such as the musk thistle at Indiana Army Ammunition Plant. Dr. Bennett said musk thistle is a classic example of a weed whose distribution has been enhanced by the absence of natural enemies. In small, isolated areas, uprooting the plant by hand and ensuring the removal of all vegetative parts can control musk thistle, but no effective method is available to control the weed in larger areas. The invasive plant had taken over hundreds of acres of the Indiana facility, to the point where the weed population had posed a serious fire hazard to the munitions stored there.

After screening the possible effects of releasing them, the Army released 40 mating pairs of Head and Rosette weevils at the Indiana ammunition plant for biological control of the musk thistle. Feasting on seeds in the flower heads of the weed, the weevils significantly reduced seed production of the pest, dramatically reducing the number of thistles.

Many other opportunities exist to reduce pesticide use through research and the implementation of innovative IPM strategies, Dr. Bennett said. He believes Army installations must take advantage of these technologies as part of its long-term pest control strategy. The key, he said, is to base the choice of technology on an understanding of how pests interact with one another and the environment.

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"RangeSafe"

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(just under the state residential safety level). Since the project had a somewhat later start date than originally planned, winter wheat - with its later growing season - was substituted for the optimal lead-absorbing mustard plant in the initial soil cleansing effort. The winter wheat also will serve to reduce winter erosion.

Fort Dix personnel expect completion of the RangeSafe project by the fall of 2000. After the winter wheat is harvested, two or three Indian Mustard crops will be planted, and then harvested for the balance of the lead. Edenspace, the Reston, VA-based company which holds the patent on the lead-eating-plant portion of the soil cleaning process, will harvest the plants, dry and bundle them, and ship them to a smelter to recover the lead. The recovered lead then will be shipped to a Pennsylvania company for recycling into batteries. With redeposit of the cleansed soil, Range 24 will be declared "clean," and ready for "green bullet" use.

Since this is a first-of-its-kind cleanup program, the Fort Dix project will be highlighted with other state-of-the-art environmental technologies to be showcased at the International Environmental Expo 2000 in Atlantic City, NJ, in June 2000. The expo will focus on the latest technologic solutions to environmental problems, emphasizing technologies with wide applicability. The Fort Dix RangeSafe demonstration project ultimately may serve as a restoration model for both public and private firing ranges worldwide.

The RangeSafe technology is not limited to lead cleanup. Because it is capable of removing other metals from soil, including low level radioactive materials, other demonstration projects are planned, targeting the removal of depleted uranium at Aberdeen Proving Ground, MD, and cesium/strontium at Fort Greeley, AK.

For further information on the RangeSafe program and the Fort Dix project contact: Mr. James Frankovic, RangeSafe Program Manager, U.S. Army Armaments Research Development and Engineering Center, Picatinny Arsenal, (973) 724-4494, e-mail: jfrank@pica.army.mil.

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